sustainability

MDPI

Article

Visitors' Perception Regarding Floating Treatment Wetlands in an Urban Green Space: Functionality and Emotional Values

Ina Falfán [1,2], Maite Lascurain-Rangel [1], Gloria Sánchez-Galván [3,*], Eugenia J. Olguín [3], Arturo Hernández-Huerta [1] and Melissa Covarrubias-Báez [4]

[1] Red de Ambiente y Sustentabilidad, Instituto de Ecología, A.C., Xalapa 91073, Veracruz, Mexico
[2] Laboratorio de Restauración Ecológica, Instituto de Biología, Universidad Nacional Autónoma de México, Coyoacán 04510, Ciudad de México, Mexico
[3] Red de Manejo Biotecnológico de Recursos, Instituto de Ecología, A.C., Xalapa 91073, Veracruz, Mexico
[4] Unidad de Servicios Profesionales Altamente Especializados (USPAE), Instituto de Ecología, A.C., Coatepec 91152, Veracruz, Mexico
* Correspondence: gloria.sanchez@inecol.mx

Abstract: Floating treatment wetlands (FTW) are artificial structures used for water quality improvement through the hydroponic growth of certain macrophytes and their rhizospheric bacteria, with the capacity for pollutant removal. Through the application of face-to-face questionnaires, our study aimed to analyze visitors' perception of the structure, functionality, and benefits of FTW installed in two ponds of one green space in Xalapa, Veracruz, Mexico, and the emotional experience that these FTW could incite in those same visitors. Visitors identified the plant component of FTW as the most noticeable one, perceived filtering/cleaning water as their principal function, and reported positive and negative emotions in the same proportion. The visitors' perceptions of FTW varied according to their age, school level, and occupation. Positive and negative perceptions regarding FTW were linked to their maintenance and that of the ponds. Visitors' awareness of FTW composition and function was associated with the presence of informative signs. The understanding of perception about the FTW can be integrated into management programs for the successful and participative improvement and cleaning of water bodies in urban settings. Along with people's participation, the municipality of the city must improve the maintenance of these important water bodies given its positive repercussions on visitors' perception.

Keywords: artificial urban ponds; blue-spaces management; cultural ecosystem services; landscape perception

Citation: Falfán, I.; Lascurain-Rangel, M.; Sánchez-Galván, G.; Olguín, E.J.; Hernández-Huerta, A.; Covarrubias-Báez, M. Visitors' Perception Regarding Floating Treatment Wetlands in an Urban Green Space: Functionality and Emotional Values. *Sustainability* **2023**, *15*, 2000. https://doi.org/10.3390/su15032000

Academic Editors: Bo Jiang and Chong Jiang

Received: 30 November 2022
Revised: 17 January 2023
Accepted: 17 January 2023
Published: 20 January 2023

1. Introduction

Urban water bodies, both natural and artificial, including those in green spaces, provide a range of valuable ecosystem services, from the purification and filtration of water itself, to habitat for a variety of wildlife species [1,2]. Moreover, the water bodies located in urban green spaces are generally public places with local human related-values linked to recreation, aesthetics, social bonds, and even to educational and scientific goals; the so-called cultural ecosystem services [2–6]. Accessibility to green and blue spaces has been positively associated with the physical, emotional, and mental health of people: reducing time for surgery recovery, reducing stress and cognitive fatigue, improving mood, and promoting positive emotions [7–13].

Nevertheless, the water bodies, including those found in urban green spaces, are highly susceptible to the effects of anthropogenic daily life activities, resulting in some cases in the decreasing of their ecological function [14]. Frequently, these water bodies are polluted with domestic wastewater discharges and other sources of organic matter, increasing their nutrient load, and hence leading to eutrophication problems, which can be more serious in shallow and slow-flowing water bodies (e.g., urban lakes and ponds [15,16]).

A high load of nutrients promotes high concentrations of phytoplankton (including harmful cyanobacteria) causing a decrement in dissolved oxygen as well as an increment of water turbidity. Furthermore, high concentrations of harmful cyanobacteria and fecal coliforms in urban water bodies represent risks to public health [17,18].

Several control measures and technologies have been tested and/or implemented to improve the quality of urban water bodies [19,20]. In the last years, floating treatment wetlands (FTW), a type of artificial wetlands, have been designed and implemented as a low-cost and environmentally friendly option [21–23]. The FTW are manmade floating structures that mimic the natural wetlands and facilitate the hydroponic growth of macrophytes, which have roots with an extensive surface area for the growth of biofilms that trap suspended particulate matter [24]. In the FTW, plants are forced to obtain their nutrients directly from the water column because they are not rooted in any sediment or support, which improves the accumulation of nutrients in their biomass [21]. Furthermore, some macrophytes used in the FTW easily adapt to the conditions of polluted water bodies favoring the removal of organic matter, nitrogen, phosphates, and dissolved solids, as well as the provision of dissolved oxygen [21,25,26].

Technologies for the treatment of green spaces' water bodies like artificial wetlands in urban settings are generally implemented by local authorities either with or without the involvement of citizens [3]. Nevertheless, as has been pointed out previously [27–31], the cooperation of people is necessary for the successful integration of technological innovations in water bodies within the broader context of programs for urban water bodies' management. For technological innovations implemented in areas with high recreational use, people's participation in preventing them from being damaged by improper use is necessary, to secure in this way, their correct and lasting functioning. For such cases, people should acknowledge the aims and functions of the implemented technological innovations and restrain the negative reactions towards them [32,33], such as vandalism, use them as garbage deposits, or express desires to remove them. In this sense, the understanding of people's perception, as well as their acceptance regarding artificial wetlands as technological innovations for water bodies treatment and their associated benefits, is not an easy task, but an essential one [27,33,34].

Landscape perception addresses the bidirectional interaction between humans and the landscape, considering experience, knowledge, expectations, and the socio-cultural context of individuals and groups as the human component of such interaction, and both the individual elements and landscapes as entities themselves as the landscape component [35–37]. Within this interaction, sensory perception is related to the visual effects of the landscape or its elements; instrumental perception includes an acknowledgment of the ecological and economic benefits and costs generated by the landscape and its elements; and symbolic perception refers to people's emotions and attitudes toward that same landscape, including its constituent elements [38–40]. Within this framework, perception is understood as a psychological and physiological process in which information is derived through senses, organized, and interpreted [41,42], and also as the result of the mental process when it is considered as a point of view, an emotion, and an attitude, preference or position regarding an object, person, group, or event [42,43].

Having this context, we aimed to analyze people's perception of the structure, functionality, and benefits (in terms of improving water quality) of FTW implemented in two ponds of a recreational urban green space in Xalapa, the capital city of the State of Veracruz, Mexico, as well as the potential emotional experience that FTW could incite on the green space' visitors. In this study, we adhere to the general definition of emotions as complex coordinated responses of an organism to several situations, as pointed out by van Heijgen [42], which can be positive or negative [44]. We further analyze people's perceptions about the structural composition and functionality of FTW and their emotional experience in association with their age, gender, occupation, and school level. At the time of our study, to the best of our knowledge, these FTW were unique in Mexico and relatively new and unknown infrastructures particularly, within such urban green space.

Thus, the perception of the FTW by local people had not yet been explored. Generally, when this type of technology, or any other technology, is implemented in public spaces, the perception of people is overlooked and hence unknown. Nonetheless, the acknowledgment of the perception about such aspects can help in the identification of implementation problems and can also be integrated into the evaluation of the management programs of the FTW, aiming to the successful participatory cleaning and improvement of water bodies in urban settings [27,28,31,33,45].

2. Materials and Methods

2.1. Study Area

Our study was carried out in the urban green space of 'Los Lagos del Dique', located to the south of the city of Xalapa, Veracruz, Mexico (19.518759, −96.921855; Figure 1). Pond 1 originated in the early 19th century due to the construction of a small dam aiming to capture the waters of a nearby spring to generate motive energy, mainly for a few textile industry factories. After the closure of the factories, this space was abandoned and later rebuilt during the second half of the 20th century, to be finally reopened for public use in 1974 [46]. Currently, it consists of a system of four elongated ponds surrounded by wide walkways, treed and garden areas, and playgrounds. The ponds are interconnected in a linear arrangement that extends along 1450 m. The water mirror of the system covers a surface of 71,588 m^2 distributed as follows: 15,268 m^2 from Pond 1; 26,190 m^2 from Pond 2, 3380 m^2 from Pond 3, and 26,750 m^2 from Pond 4. Water volumes of the ponds are 22,554 m^3, 134,844 m^3, 14,268 m^3, and 150,061 m^3 respectively, for Ponds 1 to 4 [47]. These urban artificial ponds receive water from wellsprings and stormwater runoff. Water entrance to the system of 'Los Lagos del Dique' is in its northern portion through Pond 1 at ~1354 m.a.s.l. and its water discharge point is in the southern part of Pond 4 at ~1340 m.a.s.l. with an elevation difference of ~14 m between the water entrance and discharge points. Water flow is constant from Pond 1 to Pond 2, and because of the presence of a small waterfall between Ponds 2 and 3, the water between them keeps in movement. Compared to the previous ponds, the flow in Pond 4 is slower and with strong winds counterflow is present.

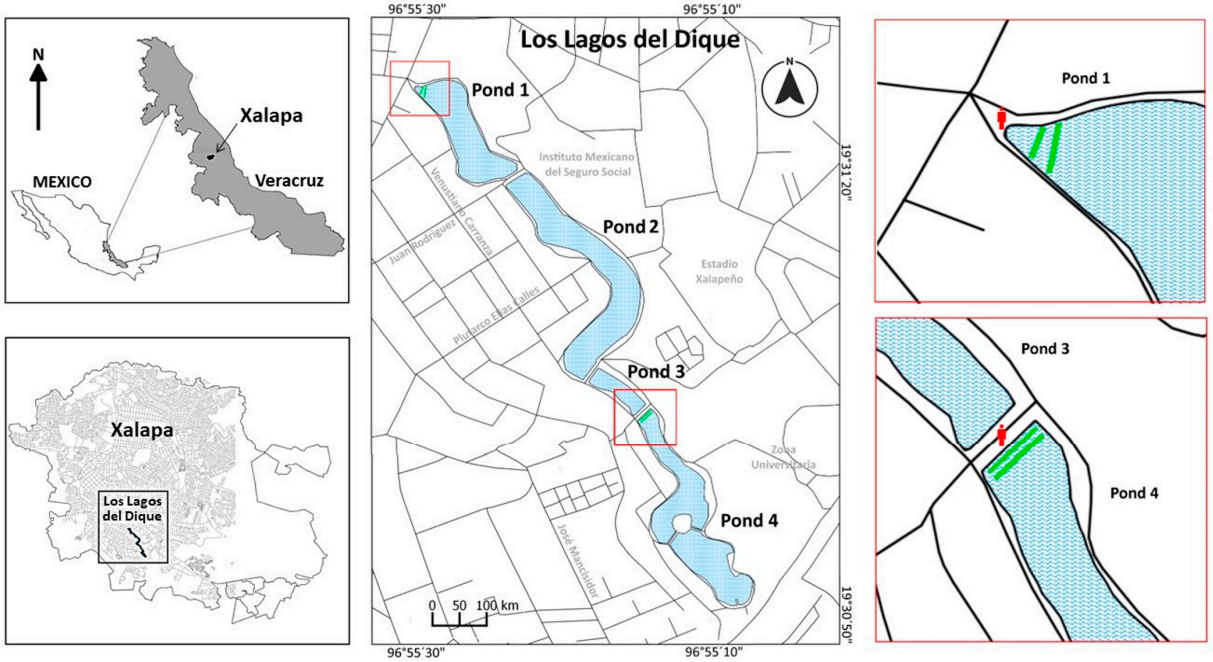

Figure 1. Location of the study area and placement of the FTW in 'Los Lagos del Dique'—the green lines. The red icon of a standing person marks the site where interviews were performed.

'Los Lagos del Dique' is completely embedded within the urban fabric of Xalapa and it is transited and visited all year round; however, human activity is more intense on weekends due to its function as an area for leisure. Different users of this green space include pedestrians, strollers, cyclists, joggers, skaters, and wildlife observers, as well as merchandisers, peddlers, and municipal workers in charge of the green space management (information gathered from personal observations carried out on weekdays and weekends in holydays and workdays from 08:00 a.m. to 11:00 p.m.).

Given the human activity around the ponds, their closeness to dwellings, and the lack of culture to preserve clean environments, the ponds' water was very polluted before 2013 with floating microalgae mats, garbage, floating oil stains, soapsuds, and organic debris; frequently there were mosquitoes and dead fishes, and occasionally bad smell [46]. Aiming to improve these conditions in 'Los Lagos del Dique', FTW were implemented in Pond 1 in August and November of 2013 by the Group of Environmental Biotechnology of the Institute of Ecology (INECOL, A.C.), with the financial support of Xalapa's municipal authorities.

2.2. Floating Treatment Wetlands Description

The first FTW were implemented in 'Los Lagos del Dique' in Pond 1 and consisted of two lines of plants arranged across the pond (line 1 = 17.5 m^2, line 2 = 33 m^2; Figure 1) aiming to serve as filters of water pollutants. Such FTW were made up of a combination of *Pontederia sagittata* and *Cyperus papyrus* assembled on rigid plastic crates attached to plastic containers for floatage (see Olguín et al. [21] for further details). After two years of monitoring, it was demonstrated that the FTW in Pond 1 promoted an increase in the dissolved oxygen within a range of 15 to 67%, removal of fecal coliforms from 9 to 86%, and a nitrate removal of 9 to 76%, according to the year seasons [21]. Given such results, additional FTW were placed in Pond 4 in June 2016 with areas of 28 m^2 (line 1) and 31 m^2 (line 2), respectively. Considering their filtering function and their size, the FTW were placed in the water entrance of Ponds 1 and 4 of the whole system of 'Los Lagos del Dique' (Figure 1).

2.3. Interviews and Statistical Analysis

To fulfill our objectives, we surveyed visitors and passers-by at 'Los Lagos del Dique', who agreed to answer a short questionnaire. The questionnaire consisted of three questions: (1) What is most noticeable about what you see here? (2) Do you have any idea about what is it/are they for? (3) What do you feel or what inspires you when you see it/them? The intentionality of these questions was to capture and evaluate in a general way and as simply as possible the sensorial perception (i.e., visual perception), perception about FTW functions (i.e., instrumental perception), and symbolic perception, namely respondents' emotions regarding FTW implemented in 'Los Lagos del Dique', respectively. We also recorded respondents' gender, age, occupation, and school level. Considering that our survey was targeted at people's perception of the structure and functionality of the FTW themselves and to avoid misunderstandings about which specific structure we were asking about, we interviewed the respondents right in front of the FTW in Ponds 1 and 4 (Figures 1 and 2); the only ponds in which there were FTW when we carried out the study. We got 400 filled questionnaires, 200 from each of two periods related to the presence or absence of informative signs explaining the functionality and benefits of the FTW in 'Los Lagos del Dique': without signs (January, May, June 2018) and with signs (September, October 2018). Both surveys were carried out from 12:00 a.m. to 4:00 p.m. Since it was of our interest to evaluate differences in responses for the three questions about the FTW concerning the presence (or absence) of the informative signs, we carried out tests for equality of proportions and Pearson's Chi-squared tests according to the case (i.e., two or more than two proportions, respectively).

Figure 2. Visitors' view floating treatment wetlands of (**A**) Pond 1 and (**B**) Pond 4.

From the multiple responses we got for our three focal questions, we obtained the following proportions: (1) the proportion of respondents that perceived or were aware of the components of FTW; (2) the proportion of respondents that accurately identified the functions of FTW; and (3) the proportion of respondents that reported positive emotions regarding FTW. We considered as positive emotions those such as peace, joy, curiosity, and satisfaction, and as negative emotions those such as frustration, anxiety, concern, and annoyance, according to Fredrickson [48] and Cohn and Fredrickson [49]. To evaluate associations of the proportions to each question and the characteristics of respondents, we carried out Classification and Regression Trees (CARTs) using the Poisson method in R [50–52], specifying the proportions as the response variables and age (in full years), gender (female, male), occupation (Primary and Secondary School Student, High School Student, College Student, Housewife Worker/Employee, Retired), and school level (None, Primary School, Secondary School, High School, University) of respondents as the explanatory ones. CARTs are multivariate statistical analyses useful to address non-linear relationships between the response and the explanatory variables, categorical and continuous [53]. The CART selects the explanatory variable for which the response variable may be best separated into two groups and identifies the optimum break point. The two resulting groups are further separated into two sub-groups based on another, or the same, explanatory variable [54]. Through such binary recursive partition, the groups, generated in a dichotomous and hierarchical manner, show values for the response variable with the maximum internal homogeneity and the maximum external differentiation [54–56].

3. Results

3.1. Description of the Respondents' Sample

The respondents' sample was comprised of an even proportion of females and males, ranging from 8–86 years old (average 30.30 ± 14.47). Most of the respondents were college students, workers or employees, and housewives. Almost fifty percent of respondents had completed studies at the high school level (Table 1).

Table 1. Characteristics of respondents regarding their gender, occupation, and school level.

	Without Signs (*n* = 200)	**With Signs (*n* = 200)**	**Total (*n* = 400)**
	Percentage	Percentage	Percentage
Gender			
Female	50.0	50.5	50.3
Male	50.0	49.5	49.8

Table 1. *Cont.*

	Without Signs (n = 200)	With Signs (n = 200)	Total (n = 400)
	Percentage	Percentage	Percentage
Occupation			
Primary school student	1.5	0.0	0.8
Secondary school student	7.5	0.5	4.0
High school student	14.5	9.5	12.0
College student	34.5	34.5	34.5
Postgraduate student	1.0	1.5	1.3
Housewife	13.0	18.0	15.5
Farmer	0.5	0.0	0.3
Worker/Employee	24.0	33.0	28.5
Retired	2.0	3.0	2.5
Missing data	1.5	0.0	0.8
Highest school level			
None	2.5	4.0	3.3
Primary school	13.0	1.5	7.3
Secondary school	26.5	29.0	27.8
High school	44.5	55.0	49.8
University	11.5	10.5	11.0
Postgraduate	0.5	0.0	0.3
Missing data	1.5	0.0	0.8

3.2. Perception of the Floating Treatment Wetlands Structure

Regarding the question 'What is most noticeable about what you see here?' we identified that respondents referred to several aspects of both the FTW itself and/or the whole system of 'Los Lagos del Dique' (Table 2; Figure 3). The three more noticeable aspects referred by respondents were (i) composition of the FTW (n = 87, 71.8%): plants were the most noticeable component, mentioned by 63% of respondents (n = 252), followed by the plastic containers, bamboo, and the plastic crates, referred by 10, 3.5, and 2.3% of respondents, respectively; (ii) maintenance of the system of 'Los Lagos del Dique' (n = 150, 37.5%): 100% of the respondents who mentioned this aspect noted it as lacking in maintenance; and (iii) system composition (n = 106, 26.5%; Figure 3): its most noticeable elements were the fishes (n = 56, 14%; including those referred as dead) and the water (n = 28, 7%). We found significant differences in the proportions of respondents that referred to the FTW composition and FTW floatage, and in the proportions of respondents that referred to the maintenance and composition of 'Los Lagos del Dique', related to the presence of the informative signs. The proportions of respondents that perceived FTW components, system maintenance, and system components were higher with the presence of signs (Table 3).

Table 2. Most noticeable aspects of floating treatment wetlands and the system of 'Los Lagos del Dique' referred by respondents.

System	Aspect	Referred Aspect as the most Noticeable
FTW	Composition	Mentioned components were plants, plastic containers, bamboo, and plastic crates (i.e., all FTW structural components).
	Arrangement	Regarding the linear disposition of the components, mainly the plants.
	Maintenance	Mentioned mainly regarding plants in a negative way: "they don't look healthy" or "they are neglected".
	Floatage	This aspect was mentioned due to the use of plastic containers.
'Los Lagos del Dique'	Composition	Mentioned components were water, fish, birds, ducks, fauna, and nature.
	Maintenance	Reported as lacking in maintenance, mainly regarding the presence of garbage or the color of the water ("green water" or "the water is green") in an unfavorable way.

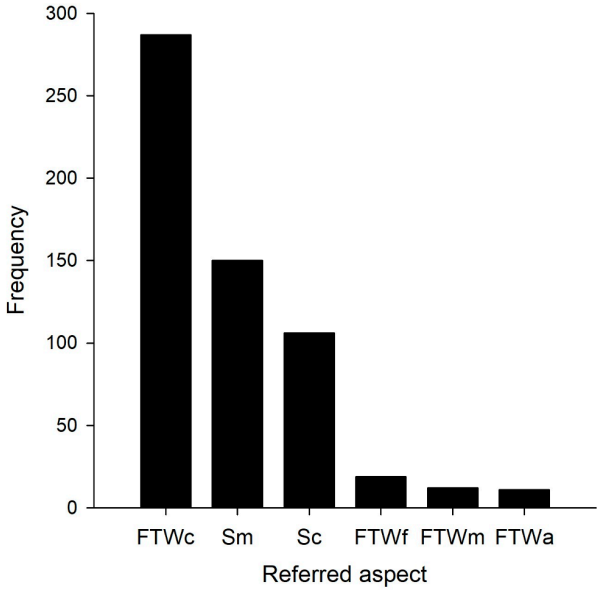

Figure 3. Aspects referred by respondents regarding the visual perception of floating treatment wetlands. FTWc: floating treatment wetland composition, FTWf: floating treatment wetland floatage, FTWm: floating treatment wetland maintenance, FTWa: floating treatment wetland arrangement, Sm: system maintenance, Sc: system composition. The bars of frequencies sum up more than 400 respondents due to those that referred to more than one aspect of the FTW.

Table 3. Test for equality of proportions in answers between the periods without and with informative signs for each of the noted aspects regarding the perception of the floating treatment wetland structure.

	Without Signs (n = 200)		With Signs (n = 200)		$Chi^2_{(1)}$	p-Value
Studied Aspects [1]	**Frequency**	**Proportion**	**Frequency**	**Proportion**		
FTWc	123	0.615	164	0.820	19.734	<0.000
FTWf	15	0.075	4	0.020	5.526	0.019
FTWm	9	0.045	3	0.015	2.148	0.143
FTWa	9	0.045	2	0.010	3.365	0.067
Sm	50	0.250	100	0.500	25.611	<0.000
Sc	40	0.200	66	0.330	8.022	0.005

[1] FTWc: floating treatment wetland composition, FTWf: floating treatment wetland floatage, FTWm: floating treatment wetland maintenance, FTWa: floating treatment wetland arrangement, Sm: system maintenance, Sc: system composition.

3.3. Perception of the Floating Treatment Wetlands Function

To investigate the perception of FTW functionality, we asked respondents: Do you have any idea about what is it/are they for? Eighty-three respondents (20.8%) from the total sample (n = 400) reported that they had no idea about the purpose of the structure or components of FTW in front of them. Four of these reported that the FTW were useless. Respondents that identified a use or function for the FTW (n = 317, 79.2%) mentioned filtering/cleaning the water as the most frequent function, followed by the functions of the FTW as an ornament/to embellish 'Los Lagos del Dique', to feed, breed, care, and retain the fishes, to retain the garbage to make it easier to collect from the ponds, and to oxygenate the water. Other less frequent answers were to provide nutrients to the water, to attract birds or as a perch for them, to sow plants, and as a barrier for the water (Table 4). From the 317 respondents who identified a use or function for the FTW, 67.8 % (n = 215) identified FTW functions adequately (i.e., those respondents who reported that their functionality was to filter/clean/oxygenate the water) and the remaining 32.2 % (n = 102) did not (i.e., all the other reported functions in Table 4). We found that the proportion of respondents who identified adequately the function of the FTW was higher with the presence of informative signs on the ponds (Table 5).

Table 4. Reported functions of the floating treatment wetlands in Pond 1 and Pond 4 in 'Los Lagos del Dique'.

Function Stated by Respondents	Frequency	Percentage
Filter/clean the water	201	63.41
Ornament/embellish the system	49	15.46
Feed, breed, care and retain the fishes	28	8.83
Retain garbage	22	6.94
Oxygenate the water	17	5.36
Sow/grow/care for plants	5	1.58
Plant floatage	3	0.95
Provide nutrients to the water	2	0.63
Avoid mud	2	0.63
Avoid pollution	2	0.63
As a barrier	2	0.63
Attract birds or as a perch for them	2	0.63
Retain/separate the water	2	0.63
Help the water	1	0.32
For recreation	1	0.32
Total [1]	339	106.94

[1] The total frequency is higher than 317 and the percentage than 100% due to those respondents that referred more than one function or use for the floating treatment wetlands.

Table 5. Chi-squared analysis results for the proportion of respondents that identified adequately the functions or use of floating treatment wetlands relating to the presence of informative signs.

	Without Signs (n = 147)		With Signs (n = 170)		$Chi^2_{(1)}$	p-Value
	Frequency	Proportion	Frequency	Proportion		
No	66	0.208	36	0.114	19.254	<0.000
Yes	81	0.256	134	0.423		

3.4. Emotions Regarding Floating Treatment Wetlands in 'Los Lagos del Dique'

The emotions reported by respondents to the question: "What do you feel or what inspires you when you see it/them?" were positive and negative (n = 344, 86.00%), but also of indifference to the FTW since some respondents answered, "nothing" (n = 55, 13.75%; Table 6). The most referred positive emotions were calmness, peace, pleasure, curiosity, and happiness, and negative ones were sadness, displeasure, and annoyance (Table 7). Considering the total of respondents (n = 399 due to one missing data), positive and negative emotions had a similar frequency of answers; 168 (42.0%) and 170 (42.5%), respectively, showing a significant relationship between the reported emotion and the presence of informative signs (Table 6). Such a relationship was due mainly to the difference in proportions for the respondents that showed indifference to the FTW (Figure 4). While the proportion of respondents who expressed positive emotions about the identification of plants as the main component of the FTW was slightly higher (0.631) than that who expressed negative emotions (0.535), the proportion test showed marginal differences between them ($Chi^2_{(1)}$ = 2.80, p = 0.094). The proportion of respondents who reported negative emotions was higher than the proportion of respondents who reported positive emotions regarding the lack of maintenance of both the FTW and the Ponds (0.565 vs. 0.214 for negative and positive emotions, respectively; $Chi^2_{(1)}$ = 42.13, $p < 0.001$), as most of the respondents expressed negative observations like "there is garbage", "there are dead fishes", "the water is dirty", "it is polluted", "it looks neglected".

Table 6. Chi-squared test for proportions of reported emotions regarding floating treatment wetlands and the presence of informative signs.

	Without Signs (n = 200)		With Signs (n = 200)		$Chi^2_{(1)}$	p-Value
	Frequency	Proportion	Frequency	Proportion		
Indifference	14	0.070	41	0.205	16.621	<0.000
Positive	84	0.420	84	0.420		
Negative	97	0.485	73	0.365		
Positive/negative [1]	4	0.020	2	0.010	-	-
Missing data [1]	1	0.005	0	0.000		

[1] Contradictory answers reporting both positive and negative emotions at the same time, as well as missing data, were not included in the Chi-squared test.

Table 7. Reported emotions regarding both the floating treatment wetlands and the system of "Los Lagos del Dique".

Positive Emotions	Frequency	Percentage	Negative Emotions	Frequency	Percentage
Calmness	74	21.51	Sadness	85	24.71
Peace	21	6.10	Displeasure	51	14.83
Pleasure	19	5.52	Annoyance	26	7.56
Curiosity	18	5.23	Frustration	6	1.74
Happiness	16	4.65	Nostalgia	3	0.87
Joy	11	3.20	Discouragement	3	0.87
Contemplation	6	1.74	Disappointment	3	0.87
Wellness	3	0.87	Anxiety	2	0.58
Motivation	3	0.87	Confusion	2	0.58
Amazement	2	0.58	Desolation	2	0.58
Entertainment	2	0.58	Depression	2	0.58
Satisfaction	2	0.58	Uncertainty	1	0.29
Remembrance	1	0.29	Concern	1	0.29
Awareness	1	0.29			
Stability	1	0.29			
Inspiration	1	0.29			
Optimism	1	0.29			
Relaxation	1	0.29			
Total [1]	183	53.20	Total [1]	187	54.36

[1] The total frequency is higher than 344 and the percentage than 100% due to those respondents that referred more than one emotion regarding the floating treatment wetlands.

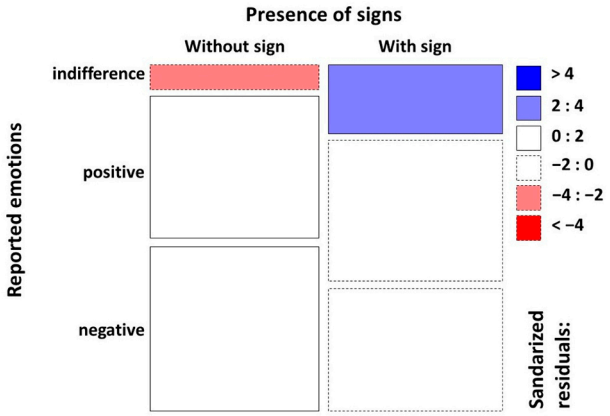

Figure 4. Mosaic-plot of standardized residuals from Chi-squared test for proportions of reported emotions regarding the floating treatment wetlands by the presence of informative signs. The size of the boxes indicates the proportion of the reported emotions by the presence of the informative signs. Solid boxes indicate positive standardized residuals and dashed boxes the negative ones. Standardized residuals indicate that the expected proportion of responses for each category was higher or lower than the observed proportion of responses for the same category.

3.5. Perception Regarding Floating Treatment Wetlands in Association with Respondents' Features

Variance in the proportion of respondents who perceived and reported some aspect of FTW (i.e., composition, arrangement, function, management) was associated with age and occupation of respondents only; the proportion of respondents that perceived some aspect regarding FTW was higher for respondents ≥ 20 years old. The proportion of respondents younger than 20 years old was associated in turn with the respondent's occupation; the proportion of college students who perceived FTW was the lowest one (Figure 5).

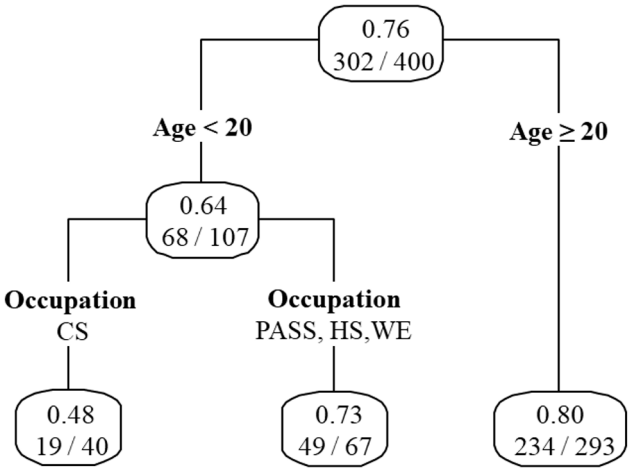

Figure 5. Classification and Regression Tree for the proportion of respondents who perceived some aspect of floating treatment wetlands in association with respondents' features. PASS—Primary and Secondary School Student, HS—High School Student, CS—College Student, WE—Worker/Employee.

The proportion of respondents who perceived adequately the function of FTW (i.e., to filter/clean/oxygenate the water) was associated with respondents' age and school level, albeit the latter one only for respondents ≥ 48 years old. Association with age was not linear since the proportion of respondents who perceived adequately the FTW functions was lower for those younger than 19 and older than 48 years old, and higher for those ≥19 and <48 years old. For those ≥48 years old the proportion was lower for respondents with no education and primary school (Figure 6).

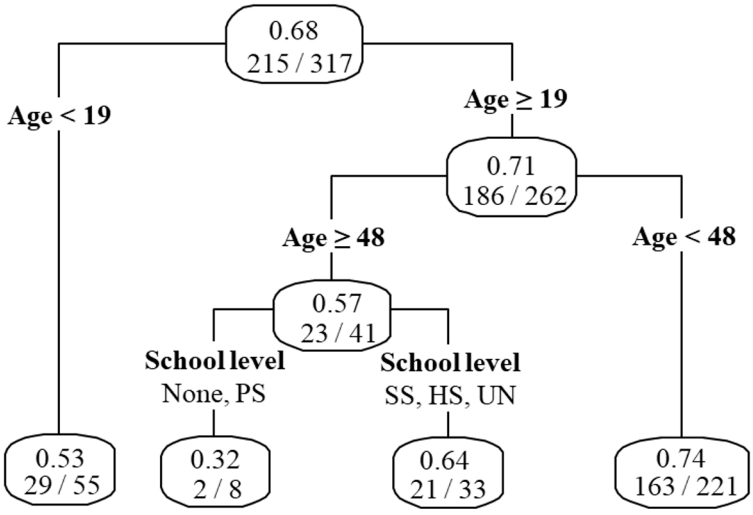

Figure 6. Classification and Regression Tree for the proportion of respondents who perceived adequately the function of floating treatment wetlands in association with respondents' features. PS—Primary School, SS—Secondary School, HS—High School, UN—University.

The proportion of respondents who reported positive emotions regarding FTW in 'Los Lagos del Dique' was associated with school level; respondents with no education showed the highest proportion of reported positive emotions. For those respondents with education, variance in proportions was associated with their age in a nonlinear way, being the lowest proportion of respondents who reported positive emotions regarding FTW for those ≥36 and <45 years old, and the highest for respondents ≥ 45 and < 50 years old (Figure 7).

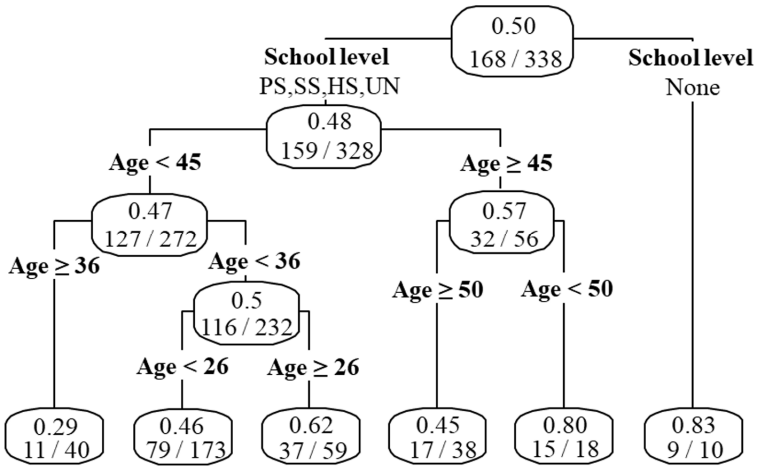

Figure 7. Classification and Regression Tree for the proportion of respondents who reported positive emotions regarding floating treatment wetlands in association with respondents' features. PS—Primary School, SS—Secondary School, HS—High School, UN—University.

4. Discussion

Visitors' sensory, instrumental, and symbolic perceptions regarding the presence, functions, and emotional values of FTW, respectively, showed to be contrasting and notably influenced by the surrounding environment of 'Los Lagos del Dique'. While people perceived mostly the vegetal components of the FTW (i.e., *Pontederia sagittata* and *Cyperus papyrus* as living components and bamboo as a structural one) [57], they also perceive the FTW as components of the ponds and the landscape of 'Los Lagos del Dique' as a whole, as expected within the landscape perception framework [35,39]. Such perception can be due, particularly, to the evident plant component of the FTW, important for both pollutant removal and local ecosystem integrity [58], and the small size of the FTW compared to the size of the ponds in this green space. The size of FTW could be also related to the fact that despite our question focused on the perception of the FTW structure itself, many respondents referred to components of the system of 'Los Lagos del Dique' in general, such as fish, birds, and nature, as some of the most distinctive elements they saw. Furthermore, some of the reported answers to the question: 'What is the most noticeable about what you see here?' were about the maintenance of 'Los Lagos del Dique' and the FTW both, and not regarding the FTW composition as we expected.

A high number of respondents perceived accurately that the function of the FTW is to filter or clean the pond's water. Yet, respondents perceived and reported FTW as garbage and/or fish retainers, and as ornamental elements of 'Los Lagos del Dique'. While such functions are not the aim of FTW, their perceived ornamental value is positive. Nevertheless, garbage and oils retention diminish the aesthetics of FTW and the ponds, as also stated by Rooney et al. [59] for shallow open water marshes near the City of Edmonton, in Alberta, Canada, and is the reason why it is necessary to implement and maintain programs of public awareness inviting visitors to 'Los Lagos del Dique' to not throw garbage into the system.

'Los Lagos del Dique' provokes both positive (e.g., calmness, pleasure, joy) and negative (e.g., sadness, frustration, annoyance) emotions in their visitors [60,61]. This coincides

with Sonti et al. [60] for the use and perceptions of New York City's forests, wetlands, and landscaped park areas, as well as with Li et al. [61], Wei et al. [62], and Kong et al. [63] for the green and blue elements of wetlands from cities in China. However, unlike these three latter studies, which recorded higher frequencies of positive emotions overall, in this study, the recorded negative emotions were higher than positive ones.

The variation in the emotions appears related to the different manners in which components of wetlands and their maintenance are perceived and experienced by the visitors [60–63]. Positive emotions seemed to be linked to the recreational activities that can be carried out in wetlands [64], which in 'Los Lagos del Dique' include jogging, walking, skating, wildlife observation, and other leisure activities. Positive emotions also appeared related to the aesthetic values of FTW and 'Los Lagos del Dique', as other studies have shown for other aspects related to wetlands in other geographical areas, such as sustainable wetland management [57] and their ecological conservation [65]. The aesthetic value of ornamental plants and their relationship with mainly positive emotions like love, tranquility, joy, and satisfaction, have also been reported by Rahnema et al. [66] for visitors to urban green spaces in Iran. Both aspects (i.e., aesthetics and recreation) are recognized as cultural ecosystem services provided by urban green and blue spaces, linked to human well-being [5,67,68]. The negative emotions were related mainly to the presence of garbage, oils, dead fishes, and the color of the water, the latter unfavorably referred to as "green water", "the water is green", or even "dirty water". These results agree with Cottet et al. [33], Dobbie [57], and Schirpke et al. [69], who highlight that the aesthetic perception of wetlands is influenced by their visual attributes, as well as their quality [70], such as the presence and look of plants and the color and transparency of the water, clear water being considered as more aesthetic or of better quality. Nevertheless, it is important to highlight that while FTW help to reduce water turbidity [17], water in 'Los Lagos del Dique' cannot be completely clear due to the natural occurrence of microalgae which provide the green color and other physical parameters not influenced by FTW functions [33]. To promote positive emotions in visitors of this green space, the maintenance of 'Los Lagos del Dique' and of the FTW is essential, since negative emotions were mainly reported regarding the presence of garbage around FTW. While the maintenance of 'Los Lagos del Dique' is the responsibility of the municipal authorities of Xalapa, the implementation (once again) of educational and participatory programs for visitors in maintaining and cleaning the system is fundamental [27,30,32].

The relevance of signs informing the function and benefits of the FTW in 'Los Lagos del Dique' was evident since the proportions of respondents that referred to FTW components, and the proportion of respondents that identified adequately the function of FTW (i.e., to filter/clean the water), were significantly higher in presence of signs than in absence of them. It seems that signs provide enough information for visitors to 'Los Lagos del Dique' to be aware of FTW and their functionality. This agrees with Dobbie [57] who mentions that knowledge of freshwater wetlands can contribute to changing people's preferences, appreciations, and perceptions about them. While signs probably reinforce knowledge [57,71] about FTW in 'Los Lagos del Dique', they are of little relevance regarding positive emotions toward them.

According to the results of our CARTs, respondents' attributes associated with: (i) the proportion of respondents who perceived some aspect regarding the FTW structure (i.e., structure' composition, management, or disposition); (ii) the proportion of respondents who perceived adequately the function of the FTW; and (iii) the proportion of respondents who reported positive emotions regarding the FTW, were age, occupation, and educational level. Such variables have been previously associated with the perception and preferences of diverse attributes of urban wetlands and urban green spaces [72–74]. Nonetheless, in such studies, the significance, magnitude, and direction of associations of respondents' attributes with their perception vary greatly depending on the particularities of such studies (e.g., aesthetics, naturalness, country). According to CARTs, there was no association of gender with any of the proportions under test, which is similar to Lee et al. [75] who found

no gender difference in the presence and environmental quality of a wetland on campus among college students, but it is contrary to found in other studies related to perception and behavior [30,57,60,76,77]. Aspects such as the restorative potential [75] and seasonal variations in people's perceptions and emotions [78] regarding FTW and the system of 'Los Lagos del Dique' remain to be studied. Besides, other variables could be added to studies of the FTW's perception (e.g., frequency of visits to the green space, income, if they have read the informative signs, length of visit, type of social stakeholder), aiming finally to include people's participation in a successful restoring of water bodies and their service providing [27,74,79]. In this case, people's care and maintenance of the FTW, like not throwing garbage or fried snacks into the ponds, and participating in supervised garbage collection brigades, are part of the advice provided during the workshops organized by our group.

5. Conclusions

Visitors of 'Los Lagos del Dique' in Xalapa, Veracruz, were widely aware of the presence, structural components, and water filtering and cleaning function of floating treatment wetlands implemented in this green space. The FTW were perceived as beneficial components of the ponds, mainly regarding the plants (*Pontederia sagittata* and *Cyperus papyrus*), which grant the FTW an additional aesthetic value. FTW cleaning function and their aesthetic value seemed to be associated with visitors' positive emotions towards them. Negative emotions expressed by 'Los Lagos del Dique' visitors were linked mainly to the lack of maintenance by the municipal authorities since the presence of garbage around the FTW persisted. FTW's composition, functionality, and emotional values were perceived by respondents differently according to their age, school level, and occupation. Informative signs were associated with the awareness of people regarding FTW composition and function, but not with the emotions of people. Besides the public awareness programs on FTW functionality and their concomitant benefits, it is also necessary that the municipality of Xalapa improve the maintenance of 'Los Lagos del Dique' (e.g., providing garbage containers and maintenance personnel). Such government commitment is crucial in both the short and long term to maximize the ecological and social benefits that the urban green space water bodies provide, by maintaining functional ponds with high-quality water using floating treatment wetlands.

Author Contributions: Conceptualization, G.S.-G., E.J.O., M.L.-R., A.H.-H., M.C-B. and I.F.; methodology, I.F., M.L.-R., M.C.-B. and A.H.-H.; formal analysis, I.F.; investigation, M.C-B.; resources, M.L.-R., G.S.-G. and E.J.O.; data curation, I.F.; writing—original draft preparation, I.F. and M.L.-R.; writing—review and editing, I.F., M.L.-R., G.S.-G. and E.J.O.; visualization, I.F.; supervision, M.L.-R., G.S.-G. and E.J.O.; project administration, M.L.-R., G.S.-G. and E.J.O.; funding acquisition, G.S.-G. and E.J.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Consejo Nacional de Ciencia y Tecnología, project number: 2015-01-1079.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: All respondents participated freely and confidentially, after explaining the survey's aims.

Data Availability Statement: The data is contained within the article.

Acknowledgments: We thank Miguel Ángel Domínguez López for his valuable help in acquiring the information. We are very grateful to Raymundo Dávalos-Sotelo for a thorough revision of the manuscript, to Reyna Paula Zárate Morales for the manuscript editing, to José Luis Martínez for the preparation and placement of wood signs in the Floating Treatment Wetlands sites, and José Luis Álvarez for the elaboration of the study area map.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. MEA (Millennium Ecosystem Assessment). *Ecosystems and Human Well-Being: Wetlands and Water Synthesis*; World Resources Institute: Washington, DC, USA, 2005; ISBN 978-1-56973-597-8.
2. Alikhani, S.; Nummi, P.; Ojala, A. Urban Wetlands: A Review on Ecological and Cultural Values. *Water* **2021**, *13*, 3301. [CrossRef]
3. Ehrenfeld, J.G. Evaluating Wetlands within an Urban Context. *Ecol. Eng.* **2000**, *15*, 253–265. [CrossRef]
4. Boyer, T.; Polasky, S. Valuing Urban Wetlands: A Review of Non-Market Valuation Studies. *Wetlands* **2004**, *24*, 744–755. [CrossRef]
5. MEA (Millennium Ecosystem Assessment). *Ecosystems and Human Well-Being: Synthesis*; Island Press: Washington, DC, USA, 2005; ISBN 978-1-59726-040-4.
6. Ghermandi, A.; van den Bergh, J.C.J.M.; Brander, L.M.; de Groot, H.L.F.; Nunes, P.A.L.D. Values of Natural and Human-Made Wetlands: A Meta-Analysis. *Water Resour. Res.* **2010**, *46*, 1–12. [CrossRef]
7. Ulrich, R. View through a Window May Influence Recovery. *Science* **1984**, *224*, 224–225. [CrossRef]
8. Hansen-Møller, J.; Oustrup, L. Emotional, Physical/Functional and Symbolic Aspects of an Urban Forest in Denmark to Nearby Residents. *Scand. J. For. Res.* **2004**, *19*, 56–64. [CrossRef]
9. Abkar, M.; Mustafa Kamal, M.S.; Mariapan, M.; Maulan, S.; Sheybanic, M. The Role of Urban Green Spaces in Mood Change. *Aust. J. Basic Appl. Sci.* **2010**, *4*, 5352–5361.
10. Beyer, K.; Kaltenbach, A.; Szabo, A.; Bogar, S.; Nieto, F.; Malecki, K. Exposure to Neighborhood Green Space and Mental Health: Evidence from the Survey of the Health of Wisconsin. *Int. J. Environ. Res. Public. Health* **2014**, *11*, 3453–3472. [CrossRef]
11. Dadvand, P.; Nieuwenhuijsen, M.J.; Esnaola, M.; Forns, J.; Basagaña, X.; Alvarez-Pedrerol, M.; Rivas, I.; López-Vicente, M.; Pascual, M.D.C.; Su, J.; et al. Green Spaces and Cognitive Development in Primary Schoolchildren. *Proc. Natl. Acad. Sci. USA* **2015**, *112*, 7937–7942. [CrossRef]
12. Gilbert, N. Green Space: A Natural High. *Nature* **2016**, *531*, S56–S57. [CrossRef]
13. Jimenez, M.P.; DeVille, N.V.; Elliott, E.G.; Schiff, J.E.; Wilt, G.E.; Hart, J.E.; James, P. Associations between Nature Exposure and Health: A Review of the Evidence. *Int. J. Environ. Res. Public. Health* **2021**, *18*, 4790. [CrossRef]
14. Imdad, K.; Rihan, M.; Sahana, M.; Parween, S.; Ahmed, R.; Costache, R.; Chaudhary, A.; Tripathi, R. Wetland Health, Water Quality, and Resident Perceptions of Declining Ecosystem Services: A Case Study of Mount Abu, Rajasthan, India. *Environ. Sci. Pollut. Res.* **2022**. [CrossRef]
15. Brönmark, C.; Hansson, L.-A. *The Biology of Lakes and Ponds*; Oxford University Press: Oxford, UK, 1998.
16. Pineda-Mendoza, R.M.; Briones-Roblero, C.I.; Gonzalez-Escobedo, R.; Rivera-Orduña, F.N.; Martínez-Jerónimo, F.; Zúñiga, G. Seasonal Changes in the Bacterial Community Structure of Three Eutrophicated Urban Lakes in Mexico City, with Emphasis on *Microcystis* Spp. *Toxicon* **2020**, *179*, 8–20. [CrossRef]
17. Waajen, G.W.A.M.; Faassen, E.J.; Lürling, M. Eutrophic Urban Ponds Suffer from Cyanobacterial Blooms: Dutch Examples. *Environ. Sci. Pollut. Res.* **2014**, *21*, 9983. [CrossRef]
18. Grentell, J.; Adhikary, R.K.; Lal, A. Cyanobacteria, Water Quality and Public Health Implications: A Systematic Scoping Review. *Australas. J. Water Resour.* **2022**, *0*, 1–13. [CrossRef]
19. Kadlec, R.H.; Wallace, S. *Treatment Wetlands*, 2nd ed.; CRC Press: Boca Raton, FL, USA, 2009.
20. Hashim, S.; Yuebo, X.; Saifullah, M.; Nabi Jan, R.; Muhetaer, A. Integrated Evaluation of Urban Water Bodies for Pollution Abatement Based on Fuzzy Multicriteria Decision Approach. *BioMed. Res. Int.* **2015**, *2015*, 1–10. [CrossRef]
21. Olguín, E.J.; Sánchez-Galván, G.; Melo, F.J.; Hernández, V.J.; González-Portela, R.E. Long-Term Assessment at Field Scale of Floating Treatment Wetlands for Improvement of Water Quality and Provision of Ecosystem Services in a Eutrophic Urban Pond. *Sci. Total Environ.* **2017**, *584–585*, 561–571. [CrossRef]
22. Afzal, M.; Arslan, M.; Müller, J.A.; Shabir, G.; Islam, E.; Tahseen, R.; Anwar-ul-Haq, M.; Hashmat, A.J.; Iqbal, S.; Khan, Q.M. Floating Treatment Wetlands as a Suitable Option for Large-Scale Wastewater Treatment. *Nat. Sustain.* **2019**, *2*, 863–871. [CrossRef]
23. Nuamah, L.A.; Li, Y.; Pu, Y.; Nwankwegu, A.S.; Haikuo, Z.; Norgbey, E.; Banahene, P.; Bofah-Buoh, R. Constructed Wetlands, Status, Progress, and Challenges. The Need for Critical Operational Reassessment for a Cleaner Productive Ecosystem. *J. Clean. Prod.* **2020**, *269*, 122340. [CrossRef]
24. Headley, T.R.; Tanner, C.C. Constructed Wetlands with Floating Emergent Macrophytes: An Innovative Stormwater Treatment Technology. *Crit. Rev. Environ. Sci. Technol.* **2012**, *42*, 2261–2310. [CrossRef]
25. McAndrew, B.; Ahn, C. Developing an Ecosystem Model of a Floating Wetland for Water Quality Improvement on a Stormwater Pond. *J. Environ. Manage.* **2017**, *202*, 198–207. [CrossRef] [PubMed]
26. Walker, C.; Tondera, K.; Lucke, T. Stormwater Treatment Evaluation of a Constructed Floating Wetland after Two Years Operation in an Urban Catchment. *Sustainability* **2017**, *9*, 1687. [CrossRef]
27. Casagrande, D.G. The Human Component of Urban Wetland Restoration. *Yale Sch. For. Environ. Stud. Bull.* **1997**, *100*, 254–270.
28. Arias-García, J.; Serrano-Montes, J.L.; Gómez-Zotano, J. Fauna in Wetland Landscapes: A Perception Approach. *Landsc. Res.* **2016**, *41*, 510–523. [CrossRef]
29. Vierikko, K.; Niemelä, J. Bottom-up Thinking—Identifying Socio-Cultural Values of Ecosystem Services in Local Blue–Green Infrastructure Planning in Helsinki, Finland. *Land Use Policy* **2016**, *50*, 537–547. [CrossRef]
30. Torres-Lima, P.; Conway-Gómez, K.; Buentello-Sánchez, R. Socio-Environmental Perception of an Urban Wetland and Sustainability Scenarios: A Case Study in Mexico City. *Wetlands* **2018**, *38*, 169–181. [CrossRef]

31. Pérez-Belmont, P.; Alvarado, J.; Vázquez-Salvador, N.; Rodríguez, E.; Valiente, E.; Díaz, J. Water Quality Monitoring in the Xochimilco Peri-Urban Wetland: Experiences Engaging in Citizen Science. *Freshw. Sci.* **2019**, *38*, 342–351. [CrossRef]
32. Ibrahim, I.; Aminudin, N.; Young, M.A.; Yahya, S.A.I. Education for Wetlands: Public Perception in Malaysia. *Procedia—Soc. Behav. Sci.* **2012**, *42*, 159–165. [CrossRef]
33. Cottet, M.; Piégay, H.; Bornette, G. Does Human Perception of Wetland Aesthetics and Healthiness Relate to Ecological Functioning? *J. Environ. Manage.* **2013**, *128*, 1012–1022. [CrossRef]
34. Ghermandi, A.; Fichtman, E. Cultural Ecosystem Services of Multifunctional Constructed Treatment Wetlands and Waste Stabilization Ponds: Time to Enter the Mainstream? *Ecol. Eng.* **2015**, *84*, 615–623. [CrossRef]
35. Zube, E.H.; Sell, J.L.; Taylor, J.G. Landscape Perception: Research, Application and Theory. *Landsc. Plan.* **1982**, *9*, 1–33. [CrossRef]
36. Menatti, L.; Heft, H. Editorial: Changing Perspectives on Landscape Perception: Seeking Common Ground Between the Psychological Sciences and the Humanities. *Front. Psychol.* **2020**, *11*, 159. [CrossRef]
37. Kühne, O. *Landscape Theories: A Brief Introduction*; Springer: Berlin/Heidelberg, Germany, 2019; ISBN 978-3-658-25491-9.
38. Appleyard, D. Urban Trees, Urban Forests: What Do They Mean? In Proceedings of the National Urban Forestry Conference, Syracuse, NY, USA, 13–16 November 1978; pp. 138–155.
39. Smardon, R.C. Perception and Aesthetics of the Urban Environment: Review of the Role of Vegetation. *Landsc. Urban Plan.* **1988**, *15*, 85–106. [CrossRef]
40. Yang, J.; Zhao, L.; Mcbride, J.; Gong, P. Can You See Green? Assessing the Visibility of Urban Forests in Cities. *Landsc. Urban Plan.* **2009**, *91*, 97–104. [CrossRef]
41. Kaymaz, I.C. Landscape Perception. In *Landscape Planning*; Ozyavuz, M., Ed.; In Tech: Rijeka, Croatia, 2012; pp. 251–276.
42. van Heijgen, E. Human Landscape Perception. In *Report on Understanding Human Landscape Perception and How to Integrate and Implement This in Current Policy Strategies*; Wageningen University: Wageningen, The Netherlands, 2013; p. 140.
43. Khatib, I.; Canetti, D.; Rubin, A. Conflict Perception: A New Scale with Evidence from Israel and Palestine. *Int. J. Confl. Manag.* **2018**, *29*, 376–397. [CrossRef]
44. Jacobs, M. The Production of Mindscapes: A Comprehensive Theory of Landscape Experience. Ph.D. Thesis, Wageningen University and Research, Wageningen, The Netherlands, 2006.
45. Guida Johnson, B.; Faggi, A.; Voigt, A.; Schnellinger, J.; Breuste, J. Environmental Perception among Residents of a Polluted Watershed in Buenos Aires. *J. Urban Plan. Dev.* **2015**, *141*, A5014002-1. [CrossRef]
46. Hernández-López, C.I.; Hernández-Aragón, S.; Gerardo-Arcos, H. Los Lagos Del Dique: Presente Contaminado. *Cienc. El Hombre* **2014**, *XXVII*, 2.
47. García-Coll, I. Estrategia para la gestión integrada del recurso hídrico de Xalapa 2019. Available online: https://ayuntamiento.xalapa.gob.mx/documents/39684/3222173/27-02_GIRH.pdf/22e46337-d20f-c4f5-2a26-7acaec0d9a9b (accessed on 12 January 2021).
48. Fredrickson, B.L. The Role of Positive Emotions in Positive Psychology. *Am. Psychol.* **2001**, *56*, 218–226. [CrossRef]
49. Cohn, M.A.; Fredrickson, B.L. Positive Emotions. In *The Oxford Handbook of Positive Psychology*; Snyder, C.R., Lopez, S.J., Eds.; Oxford University Press: New York, NY, USA, 2011; pp. 13–24. ISBN 978-0-19-518724-3.
50. Milborrow, S. Rpart.Plot: Plot "rpart" Models: An Enhanced Version of "Plot.Rpart". R Package Version 3.0.6. 2018, p. 36. Available online: http://www.milbo.org/doc/prp.pdf (accessed on 19 April 2019).
51. *R Core Team R: A Language and Environment for Statistical Computing*; R Foundation for Statistical Computing: Vienna, Austria, 2018.
52. Therneau, T.; Atkinson, B. Package "Rpart": Recursive Partitioning and Regression Trees. R Package Version 4.1-13. 2018. Available online: https://CRAN.R-project.org/package=rpart (accessed on 1 April 2019).
53. De'ath, G.; Fabricius, K.E. Classification and Regression Trees: A Powerful yet Simple Technique for Ecological Data Analysis. *Ecology* **2000**, *81*, 3178–3192. [CrossRef]
54. Patriche, C.V.; Pîrnău, R.G.; Roşca, B. Comparing Linear Regression and Regression Trees for Spatial Modelling of Soil Reaction in Dobrovăţ Basin (Eastern Romania). *Bull. Univ. Agric. Sci. Vet. Med. Cluj-Napoca Agric.* **2011**, *68*, 264–271. [CrossRef]
55. De'Ath, G. Multivariate Regression Trees: A New Technique for Modeling Species-Environment Relationships. *Ecology* **2002**, *83*, 1105–1117.
56. Palomino, D.; Carrascal, L.M. Threshold Distances to Nearby Cities and Roads Influence the Bird Community of a Mosaic Landscape. *Biol. Conserv.* **2007**, *140*, 100–109. [CrossRef]
57. Dobbie, M.F. Public Aesthetic Preferences to Inform Sustainable Wetland Management in Victoria, Australia. *Landsc. Urban Plan.* **2013**, *120*, 178–189. [CrossRef]
58. Pavlineri, N.; Skoulikidis, N.T.; Tsihrintzis, V.A. Constructed Floating Wetlands: A Review of Research, Design, Operation and Management Aspects, and Data Meta-Analysis. *Chem. Eng. J.* **2017**, *308*, 1120–1132. [CrossRef]
59. Rooney, R.C.; Foote, L.; Krogman, N.; Pattison, J.K.; Wilson, M.J.; Bayley, S.E. Replacing Natural Wetlands with Stormwater Management Facilities: Biophysical and Perceived Social Values. *Water Res.* **2015**, *73*, 17–28. [CrossRef]
60. Sonti, N.F.; Campbell, L.K.; Svendsen, E.S.; Johnson, M.L.; Novem Auyeung, D.S. Fear and Fascination: Use and Perceptions of New York City's Forests, Wetlands, and Landscaped Park Areas. *Urban For. Urban Green.* **2020**, *49*, 126601. [CrossRef]
61. Li, H.; Peng, J.; Jiao, Y.; Ai, S. Experiencing Urban Green and Blue Spaces in Urban Wetlands as a Nature-Based Solution to Promote Positive Emotions. *Forests* **2022**, *13*, 473. [CrossRef]

62. Wei, H.; Hauer, R.J.; Sun, Y.; Meng, L.; Guo, P. Emotional Perceptions of People Exposed to Green and Blue Spaces in Forest Parks of Cities at Rapid Urbanization Regions of East China. *Urban For. Urban Green.* **2022**, *78*, 127772. [CrossRef]
63. Kong, L.; Liu, Z.; Pan, X.; Wang, Y.; Guo, X.; Wu, J. How Do Different Types and Landscape Attributes of Urban Parks Affect Visitors' Positive Emotions? *Landsc. Urban Plan.* **2022**, *226*, 104482. [CrossRef]
64. Pedersen, E.; Weisner, S.E.B.; Johansson, M. Wetland Areas' Direct Contributions to Residents' Well-Being Entitle Them to High Cultural Ecosystem Values. *Sci. Total Environ.* **2019**, *646*, 1315–1326. [CrossRef]
65. Lee, L.-H. Perspectives on Landscape Aesthetics for the Ecological Conservation of Wetlands. *Wetlands* **2017**, *37*, 381–389. [CrossRef]
66. Rahnema, S.; Sedaghathoor, S.; Allahyari, M.S.; Damalas, C.A.; Bilali, H.E. Preferences and Emotion Perceptions of Ornamental Plant Species for Green Space Designing among Urban Park Users in Iran. *Urban For. Urban Green.* **2019**, *39*, 98–108. [CrossRef]
67. Daniel, T.C.; Muhar, A.; Arnberger, A.; Aznar, O.; Boyd, J.W.; Chan, K.M.A.; Costanza, R.; Elmqvist, T.; Flint, C.G.; Gobster, P.H.; et al. Contributions of Cultural Services to the Ecosystem Services Agenda. *Proc. Natl. Acad. Sci. USA* **2012**, *109*, 8812–8819. [CrossRef]
68. Huynh, L.T.M.; Gasparatos, A.; Su, J.; Dam Lam, R.; Grant, E.I.; Fukushi, K. Linking the Nonmaterial Dimensions of Human-Nature Relations and Human Well-Being through Cultural Ecosystem Services. *Sci. Adv.* **2022**, *8*, eabn8042. [CrossRef]
69. Schirpke, U.; Scolozzi, R.; Tappeiner, U. "A Gem among the Rocks"—Identifying and Measuring Visual Preferences for Mountain Lakes. *Water* **2021**, *13*, 1151. [CrossRef]
70. Li, J.; Pan, Q.; Peng, Y.; Feng, T.; Liu, S.; Cai, X.; Zhong, C.; Yin, Y.; Lai, W. Perceived Quality of Urban Wetland Parks: A Second-Order Factor Structure Equation Modeling. *Sustainability* **2020**, *12*, 7204. [CrossRef]
71. Ham, S.H. *Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets*; Fulcrum/North American Press: Golden, CO, USA, 1992.
72. Kaplowitz, M.D.; Kerr, J. Michigan Residents' Perceptions of Wetlands and Mitigation. *Wetlands* **2003**, *23*, 267–277. [CrossRef]
73. Buijs, A.E.; Elands, B.H.M.; Langers, F. No Wilderness for Immigrants: Cultural Differences in Images of Nature and Landscape Preferences. *Landsc. Urban Plan.* **2009**, *91*, 113–123. [CrossRef]
74. Scholte, S.S.K.; van Teeffelen, A.J.A.; Verburg, P.H. Integrating Socio-Cultural Perspectives into Ecosystem Service Valuation: A Review of Concepts and Methods. *Ecol. Econ.* **2015**, *114*, 67–78. [CrossRef]
75. Lee, L.K.; Zakaria, N.A.; Foo, K.Y. Psychological Restorative Potential of a Pilot On-Campus Ecological Wetland in Malaysia. *Sustainability* **2022**, *14*, 246. [CrossRef]
76. Stern, P.C.; Dietz, T.; Kalof, L. Value Orientations, Gender, and Environmental Concern. *Environ. Behav.* **1993**, *25*, 322–348. [CrossRef]
77. Ode Sang, Å.; Knez, I.; Gunnarsson, B.; Hedblom, M. The Effects of Naturalness, Gender, and Age on How Urban Green Space Is Perceived and Used. *Urban For. Urban Green.* **2016**, *18*, 268–276. [CrossRef]
78. Li, Y.; Sun, Y.; Zhao, Y.; Wang, Y.; Cheng, S. Mapping Seasonal Sentiments of People Visiting Blue Spaces in Urban Wetlands: A Pilot Study on Inland Cities of China. *Front. Ecol. Evol.* **2022**, *10*, 798. [CrossRef]
79. Nassauer, J.I.; Kosek, S.E.; Corry, R.C. Meeting Public Expectations with Ecological Innovation in Riparian Landscapes. *J. Am. Water Resour. Assoc.* **2001**, *37*, 1439–1443. [CrossRef]